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Examiner Michael Cygan, Group Art Unit 2856	US Patent and Trademark Office		571-272-2175 203-672-9306

From: Kenneth Solomon

Date: 05/17/2004

Message: In re Application of: Jones, et al.
Serial No. 09/509126
Filing Date: 3/22/2000
Title: Measurement and control of asphaltene agglomeration in
hydrocarbon liquid

Att/Client/Matter No.: 3080/56010/04074

Total Number of Pages, including this page: 13

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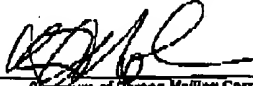
Thank you,

Fax Department - Operator: 021

Time of Transmittal: 2:45 A.M./P.M.

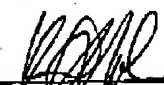

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TRANSMITTAL LETTER (General - Patent Pending)			Docket No. 6010-4074 (Our No. 56010-4074)
In Re Application Of: Jones et al			
Serial No. 09/509126	Filing Date 03/22/2000	Examiner Michael Cygan	Group Art Unit 2856
Title: MEASUREMENT AND CONTROL OF ASPHALTENE AGGLOMERATION IN HYDROCARBON LIQUID			
<u>TO THE COMMISSIONER OF PATENTS AND TRADEMARKS</u>			
Transmitted herewith is: Request for Continued Examination (RCE) Transmittal Terminal Disclaimer Fee Transmittal Amendment			
in the above identified application.			
<input type="checkbox"/> No additional fee is required. <input type="checkbox"/> A check in the amount of \$_____ is attached. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge and credit Deposit Account No. 20-0823 as described below. A duplicate copy of this sheet is enclosed. <input checked="" type="checkbox"/> Charge the amount of <u>\$880.00</u> <input checked="" type="checkbox"/> Credit any overpayment. <input checked="" type="checkbox"/> Charge any additional fee required.			
 _____ <i>Signature</i>		Dated: May <u>17</u> , 2004 Thompson Coburn LLP	
Kenneth Solomon, Reg. #3142/ Thompson Coburn LLP One US Bank Plaza, Suite 3600 St. Louis, Missouri 63101 314-552-6297 314-552-7297 FAX		DOCKETED MAY 19 2004	
Customer No. 20-0823		CERTIFICATE OF FACSIMILE TRANSMISSION I hereby certify that this correspondence and the documents referred to as enclosed herein are being transmitted via facsimile to fax number 571-212-2175 on May 17, 2004.  _____ <i>Signature of Person Mailing Correspondence</i> Kenneth Solomon _____ <i>Typed or Printed Name of Person Mailing Correspondence</i>	

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P108/REV01

TRANSMITTAL LETTER (General - Patent Pending)			Docket No. 6010-4074 (Our No. 56010-4074)
In Re Application Of: Jones et al			
Serial No. 09/509126	Filing Date 03/22/2000	Examiner Michael Cygan	Group Art Unit 2856
Title: MEASUREMENT AND CONTROL OF ASPHALTENE AGGLOMERATION IN HYDROCARBON LIQUID			
<u>TO THE COMMISSIONER OF PATENTS AND TRADEMARKS</u>			
<p>Transmitted herewith is:</p> <ul style="list-style-type: none"> Request for Continued Examination (RCE) Transmittal Terminal Disclaimer Fee Transmittal Amendment <p style="text-align: right; font-size: 2em; opacity: 0.5;">COPY</p> <p>in the above identified application.</p> <p> <input type="checkbox"/> No additional fee is required. <input type="checkbox"/> A check in the amount of \$ _____ is attached. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge and credit Deposit Account No. 20-0823 as described below. A duplicate copy of this sheet is enclosed. </p> <p> <input checked="" type="checkbox"/> Charge the amount of <u>\$580.00</u>. <input checked="" type="checkbox"/> Credit any overpayment. <input checked="" type="checkbox"/> Charge any additional fee required. </p> <div style="display: flex; justify-content: space-between; align-items: flex-end; margin-top: 20px;"> <div style="text-align: center;">  _____ <small>Signature</small> </div> <div> Dated: May <u>17</u>, 2004 </div> </div> <div style="margin-top: 20px;"> Kenneth Solomon, Reg. #31427 Thompson Coburn LLP One US Bank Plaza, Suite 3500 St. Louis, Missouri 63101 314-552-6297 314-552-7297 FAX </div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-top: 20px;"> <p style="text-align: center; margin: 0;"><u>CERTIFICATE OF FACSIMILE TRANSMISSION</u></p> <p style="font-size: 0.8em; margin: 0;">I hereby certify that this correspondence and the documents referred to as enclosed therein are being transmitted via facsimile to fax number 571-272-2175 on <u>May 17, 2004</u>.</p> <div style="text-align: center; margin: 10px 0;">  <small>Signature of Person Mailing Correspondence</small> </div> <p style="text-align: center; margin: 0;">Kenneth Solomon <small>Typed or Printed Name of Person Mailing Correspondence</small></p> </div> <div style="margin-top: 20px;"> Customer No. 20-0823 </div>			

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Approved for use through 07/31/2000. OMB 0661-0032
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FEE TRANSMITTAL for FY 2004 Effective 10/01/2003. Patent fees are subject to annual revision.		Complete if Known	
		Application Number	09/509126
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27 TOTAL AMOUNT OF PAYMENT (\$) 880.00		Filing Date	March 22, 2000
		First Named Inventor	Jones, et al.
		Examiner Name	Michael Cygan
		Art Unit	2856
		Attorney Docket No.	6010/4074 (Our No. 56010/4074)

METHOD OF PAYMENT (check all that apply) <input type="checkbox"/> Check <input type="checkbox"/> Credit Card <input type="checkbox"/> Money Order <input type="checkbox"/> Other <input type="checkbox"/> None <input checked="" type="checkbox"/> Deposit Account: Deposit Account Number: 20-0823 Deposit Account Name:		FEE CALCULATION (continued) 3. ADDITIONAL FEES																																																																																																																																																													
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SUBMITTED BY		Complete (if applicable)	
Name (Print/Type)	Kenneth Solomon	Registration No. (Attorney/Agent)	31427
Signature	<i>Kenneth Solomon</i>	Telephone	314-552-6297
		Date	May 17, 2004

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Docket No. 56010-4074

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OFFICIAL


Kenneth Solomon
Reg. No. 31,427

Application of:	Jones et al.	Group No.:	2856
Serial No.:	09/509,126	Atty. Docket No.:	56010/4074
Filed:	March 22, 2000		
For:	Measurement and Control of Asphaltene Agglomeration in Hydrocarbon Liquid	Examiner:	Michael Cygan

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT

In response to the Notice of Allowance of March 5, 2004, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 3 of this paper.

Remarks/Arguments begin on page 7 of this paper.

Applicant received a Notice of Allowance, mailed on March 5, 2004. In the Notice, the Examiner allowed only claim 23, which the Examiner rewrote by an Examiner Amendment. Applicant hereby cancels claims 12-14 and 23 in the present application, and files a terminal disclaimer to overcome the obviousness-type double patenting rejection of claims 1-11, 15-22 and 24-26. Applicant submits herewith a Request for Continued Examination.

2319866

-1-

Docket No. 56010-4074

PATENT

BACKGROUND

In the Office Action, mailed on April 3, 2001, paper no. 6, the Office rejected claims 1 - 19 as being allegedly obvious in view of de Boer (SPE Production & Facilities 1995) and Gopinathan (U.S. patent no. 5,853,994). The Office also rejected claims 1-11, 15-22, and 24-26 under the judicially created doctrine of obviousness-type double patenting as being allegedly unpatentable over claims 1-20 of U.S. patent no. 5,969,737. Applicant appealed the Office's final rejections of the claims to the Board of Patent Appeals and Interferences. On November 25, 2003, the Board rendered its decision in favor of Applicant with respect to the obviousness rejection of claims 1-19. The Board, however, sustained the double patenting rejection of claims 1-11, 15-22, and 24-26. Subsequently, the Office issued a Notice of Allowance in which the Office allowed only an amended claim 23. Claim 23 was amended by an Examiner's Amendment.

2319866

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Docket No. 56010-4074

PATENT

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A method for measuring the agglomerative state of asphaltenes in oil containing asphaltenes, comprising applying to the oil a series of pulses of acoustic energy, each pulse comprising acoustic energy at multiple frequencies, thereby scattering at least part of the energy; detecting, for each of a plurality of pulses in the series, the scattered acoustic energy to produce amplitude versus time data; resolving the amplitude versus time data to obtain a magnitude of the detected scattered acoustic energy at selected frequencies; averaging over the plurality of pulses the magnitude for each pulse at each selected frequency; and determining from the averaging the agglomerative state of the asphaltenes.

2. (Previously Presented) A method as set forth in claim 1 wherein the selected frequencies comprise at least three different frequencies.

3. (Previously Presented) A method as set forth in claim 1 wherein the selected frequencies comprise at least fifteen different frequencies.

4. (Original) A method as set forth in claim 1 wherein the steps are carried out without diluting the hydrocarbon liquid.

5. (Original) A method as set forth in claim 4 wherein the steps of the method are carried out substantially instantaneously.

6. (Original) A method as set forth in claim 5, wherein the detected scattered acoustic energy is back-scattered acoustic energy.

7. (Previously Presented) A method as set forth in claim 6, wherein the scattered acoustic energy is detected over a frequency range of from about 0.1 MHz to about 20 MHz.

2319866

- 3 -

Docket No. 56010-4074

PATENT

8. (Previously Presented) A method as set forth in claim 7, wherein the scattered acoustic energy is detected over a frequency range of from about 0.1 MHz to about 200 MHz.

9. (Previously Presented) A method as set forth in claim 8, wherein the scattered acoustic energy is detected over a frequency range of from about 14 MHz to about 20 MHz.

10. (Original) A method as set forth in claim 1, wherein the detecting is carried out by at least one sensor which sensor is incorporated in a signal input probe.

11. (Original) A method as set forth in claim 1, wherein the detecting is carried out by at least one sensor which sensor is separate from a signal input probe.

12. (Withdrawn) A method as set forth in claim 11, wherein the signal input probe and the sensor are located so that the signal direction of the probe intersects the signal direction of the sensor at an angle of less than about 90°.

13. (Withdrawn) A method as set forth in claim 12, wherein the signal input probe and the sensor are located so that the signal direction of the probe intersects the signal direction of the sensor at an angle of less than about 60°.

14. (Withdrawn) A method as set forth in claim 13, wherein the signal input probe and the sensor are located so that the signal direction of the probe intersects the signal direction of the sensor at an angle of less than about 45°.

15. (Previously Presented) A method as set forth in claim 1, wherein the resolving of the amplitude versus time data comprises gating the detected scattered acoustic energy to that part of the detected energy emanating from a focal region and Fourier transforming the amplitude versus time data into a magnitude vs. frequency format.

16. (Previously Presented) A method as set forth in claim 1, wherein the pulses of acoustic energy are applied as a tone-burst and the step of resolving of the amplitude versus time data comprises detecting the magnitude of the scattered energy at selected frequencies.

Docket No. 56010-4074

PATENT

17. (Previously Presented) A method as set forth in claim 1, wherein the averaging over the series of pulses the magnitude for each pulse at each selected frequency produces an average of the magnitude for each selected frequency, and the determining of the agglomerative state of the asphaltene is effected by comparing the that average for each selected frequency with a standard.

18. (Original) A method as set forth in claim 17, wherein the standard is a sample of known particle size.

19. (Original) A method as set forth in claim 17, wherein the standard is a model of particle size based on scattering theory.

20. (Original) A method as set forth in claim 1, wherein the oil containing asphaltene is in a process flow stream and the signal of acoustic energy is applied to the oil in the process flow stream.

21. (Previously Presented) A method for measuring the agglomerative state of asphaltene in an oil containing asphaltene comprising:

- a. removing a sample of the oil and without diluting the oil;
- b. applying to the sample a series of pulses of acoustic energy, each pulse comprising acoustic energy at multiple frequencies, thereby scattering at least part of the energy;
- c. detecting, for each of a plurality of pulses in the series, the magnitude of the scattered acoustic energy at selected frequencies to produce amplitude versus time data;
- d. resolving the amplitude versus time data to obtain a magnitude of the detected scattered acoustic energy at selected incremental frequencies;
- e. averaging over the plurality of pulses the magnitude for each pulse at each selected frequency;
- f. deriving from the averaging a distribution of the relative size of asphaltene particles scattering acoustic energy; and
- g. determining the agglomerative state of the asphaltene particles.

22. (Original) A method as in claim 20, having the additional step of returning the undiluted oil sample.

2319866

- 5 -

Docket No. 56010-4074

PATENT

23. (Withdrawn) A method for measuring the agglomerative state of asphaltenes in oil containing asphaltenes, comprising applying to the oil a series of pulses of acoustic energy, each pulse comprising acoustic energy at multiple frequencies, thereby scattering at least part of the energy; detecting, for each of a plurality of pulses in the series, the scattered acoustic energy to produce amplitude versus time data; resolving the amplitude versus time data to obtain a magnitude of the detected scattered acoustic energy at selected frequencies; averaging over the plurality of pulses the magnitude for each pulse at each selected frequency; and determining from the averaging the agglomerative state of the asphaltenes, wherein the oil containing asphaltenes is in a process flow stream, and wherein the method is carried out in a bench-scale device.

24. (Previously Presented) A method for controlling the agglomeration of asphaltenes in oil which comprises applying a series of pulses of acoustic energy to the oil, each pulse comprising acoustic energy at multiple frequencies, thereby scattering at least a part of the energy; detecting, for each of a plurality of pulses in the series, the scattered energy at selected frequencies to produce amplitude versus time data; resolving the amplitude versus time data to obtain a magnitude of the detected scattered energy at selected incremental frequencies; averaging over the plurality of pulses the magnitude for each pulse at each selected frequency to obtain average magnitude versus frequency data; comparing the average magnitude versus frequency data with a standard; and acting to control the number of particles having a particle size corresponding to the selected incremental frequencies.

25. (Previously Presented) A method as set forth in claim 24, wherein the selected frequencies are limited to a frequency range of acoustic energy scattered by the agglomerated asphaltene particles characteristic of the oil.

26. (Previously Presented) A method as set forth in claim 24, wherein the scattered acoustic energy is detected over a frequency range of from about 14 MHz to about 20 MHz.

2319866

- 6 -

Docket No. 56010-4074

PATENT

Remarks/Arguments:

REMARKS

Given that the Board reversed the Office's obviousness rejection of claims 1-19, Applicant submits that the allowance of only claim 23 is improper. No rejection remains as to claims 12-14. Moreover, claims 1 - 11 and 15 - 19 are now subject only to the obviousness-type double patenting rejection and so should be allowable upon Applicant's filing of a terminal disclaimer. Likewise only an obviousness-type double patenting rejection remains as to claims 20 - 22 and 24 - 26. Applicant submits herewith a terminal disclaimer to overcome the double patenting rejection of claims 1-11, 15-22, and 24-26. Applicant hereby cancels claims 12-14 and 23, which are not subject to the double-patenting rejection, in the present application. Applicant would like to pursue these claims in a separate application.

CONCLUSION

The obviousness-type double patenting rejection was the only remaining rejection in the prosecution of the present application. Upon filing of the terminal disclaimer, Applicant believes that all of the rejections and objections in the present application have been obviated, overcome, or rendered moot. Favorable consideration and early allowance of the present application are earnestly solicited.

Respectfully submitted,

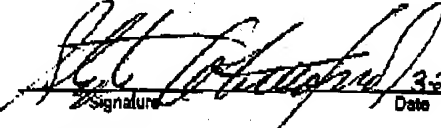


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PTO/SB/28 (08-07)

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TERMINAL DISCLAIMER TO OBLIVATE A DOUBLE PATENTING REJECTION OVER A PRIOR PATENT	Docket Number (Optional) 56010-4074
<p>In re Application of: Gregory M. Jones, et al.</p> <p>Application No.: 09/509,126</p> <p>Filed: March 22, 2000</p> <p>For: Measurement and control of asphaltene agglomeration in hydrocarbon liquids</p> <p>The owner, Baker Hughes, Inc., of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application, which would extend beyond the expiration date of the full statutory term defined in 35 U.S.C. 154 and 173, as presently shortened by any terminal disclaimer, of prior Patent No. 5,889,737. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.</p> <p>In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 and 173 of the prior patent, as presently shortened by any terminal disclaimer, in the event that it later expires for failure to pay a maintenance fee, is held unenforceable, if found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.</p> <p>Check either box 1 or 2 below, if appropriate.</p> <p>1. <input checked="" type="checkbox"/> For submissions on behalf of an organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the organization.</p> <p>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issued thereon.</p> <p>2. <input checked="" type="checkbox"/> The undersigned is an attorney or agent of record.</p> <div style="text-align: right; margin-top: 20px;">  Signature Date </div> <div style="text-align: center; margin-top: 10px;"> STEPHEN A. LITTLEFIELD Typed or printed name </div> <div style="text-align: center; margin-top: 10px;"> 281-276-5773 Telephone Number </div> <p><input checked="" type="checkbox"/> Terminal disclaimer fee under 37 CFR 1.20(d) is included.</p> <p style="text-align: center;">WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2838.</p> <p>*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner). Form PTO/SB/94 may be used for making this statement. See MPEP § 324.</p>	

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Request for Continued Examination (RCE) TRANSMITTAL Address to: Mail Stop RCE Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450	Application Number	09/509,126
	Filing Date	March 22, 2000
	First Named Inventor	Jones, et al.
	Art Unit	2856
	Examiner Name	Michael Cygon
	Attorney Docket Number	6010/4074 (Our No. 56010/4074)

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application. Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. **Submission required under 37 CFR 1.114** Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).
- a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.
- i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ii. ☐ Other _____
- b. ☒ Enclosed.
- i. ☒ Amendment/Reply
- ii. ☐ Affidavit(s)/Declaration(s)
- iii. ☐ Information Disclosure Statement (IDS)
- iv. ☒ Other Terminal Disclaimer _____
2. **Miscellaneous**
- a. ☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 C.F.R. 1.17(b) required.)
- b. ☐ Other _____
3. **Fees** The RCE fee under 37 CFR 1.17(c) is required by 37 CFR 1.114 when the RCE is filed.
- a. ☒ The Director is hereby authorized to charge the following fees, or credit any overpayments, to Deposit Account No. 20-0823.
- i. ☒ RCE fee required under 37 CFR 1.17(a)
- ii. ☐ Extension of time fee (37 CFR 1.136 and 1.17)
- iii. ☐ Other _____
- b. ☐ Check in the amount of \$ _____ enclosed
- c. ☐ Payment by credit card (Form PTO-2038 enclosed)
- WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Name (Print/Type)	Kenneth Solomon	Registration No. (Attorney/Agent)	31427
Signature		Date	May 17, 2004

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 or business transmitted to the U.S. Patent and Trademark Office on the date shown below.

Name (Print/Type)	Kenneth Solomon	Date	May 17, 2004
Signature			

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